



Chico

**Golden
Empire
Amateur
Radio
Society, Inc.**

www.gearsww6rhc.org

"Dedicated to Public Service"

THE RADIATOR



W6RHC
IRLP #8170



P.O. Box 202 Chico, CA 95927

March 2023 Newsletter

GEARS Founded August 13, 1939

From the President

I enjoyed giving a presentation on Parks on the Air (POTA) at the February GEARS meeting. For those looking to get earned recognition of your radio contact achievements, and not just participation trophies, but without the chaos of pile-ups during contests, this award is for you. A POTA station can be set up in State or Federal parks. For more information see: <https://parksontheair.com/>

The cover of the latest QST magazine (March 2023) has a cover story with the headline "How to Be the Activator that Chasers Need!" The story is about Summits on the Air (SOTA). The SOTA website is <https://www.sota.org.uk/>

The ARRL's most popular award is its WAS (Worked All States) award. <https://www.arrl.org/was> CQ Amateur Radio magazine has several tiers for its USA County Awards.

The most accessible CQ County award requires 500 counties to be confirmed without several states required. Higher tiers need counties to be in at least 25 different states. https://cq-amateur-radio.com/cq_awards/cq_usa_ca_awards/cq_usa_ca_awards.html

CERT is having a "Preparedness Information For The Public" class at the OEM Training Room, 205 Mira Loma Dr, Oroville at 9 am for 3 hours on Saturday, March 11.

The Loomis Ham Fest is Saturday March 18th. I'm sure some GEARS members will be carpooling down.

The next ham radio breakfast will also be at 9am on the second Saturday, March 11th at Farmer's Skillet on Cohasset in Chico.

The next general meeting, the third Monday on March 20th is at the Chico Public Library, 1108 Sherman Ave. 6 pm social gathering, 7 pm meeting.

Check in to the GEARS net at 7:30 pm Tuesdays on 146.85- pl 110.9.


'73

J. Kent Hastings WA6ZFY

wa6zfy@arrl.net



March 2023 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 7:30pm Simplex Net	3	4
5 8pm OARS Net	6 7pm GARS Net 8pm ARES Net 7pm GEARS Board Meeting	7 7pm PARS Net 7:30pm GEARS Net	8	9 6:30 pm PARS meetings 7:30pm Simplex Net	10 7pm OARS meeting 7pm GARS meeting	11 9am Chico Breakfast
12 8pm OARS Net	13 7pm GARS Net 8pm ARES Net	14 7pm PARS Net 7:30pm GEARS Net	15	16 7:30pm Simplex Net	17 	18 HamFest Loomis
19 8pm OARS Net	20 6pm GEARS Meeting 7pm GARS Net 8pm ARES Net	21 7pm PARS Net 7:30pm GEARS Net	22	23 7:30 Simplex Net	24	25 9am OARS Breakfast
26	27 7pm GARS Net 8pm ARES Net	28 7:30pm GEARS Net	29	30 7:30 Simplex Net	31	

VEC Testing, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211

Chico Breakfast 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico

GEARS Board Meeting 1st Monday 7pm by Google video meetups.

PARS Meeting 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center

OARS Meeting Second Friday of the month, St. Pauls Episcopal Church Hall, Oroville.

GARS Meeting Second Friday of the month, Lutheran Church Hall, Artois.

GEARS Meeting, Doors open 6pm, meeting 7pm at Chico Public Library, 1108 Sherman Ave, Chico

OARS Breakfast 4th Saturday of the month, at Cornucopia of Oroville.

NETS:

OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5

GARS Club Net Monday, 7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9

Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3

GEARS Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9

PARS Club Net Tuesday 7pm 145.290 - PL 110.9

Simplex Net Thursday 7:30 p.m. 146.52 no tone

Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3

Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

THE FIRST HAM SWAP OF THE YEAR IS COMING!



7TH ANNUAL LOOMIS HAMFEST



Join the Sierra Foothills Amateur Radio Club for HAMFEST 2023!

Get your stuff, grab your wallet and get ready for a super swap! We'll have donuts, coffee, Hamfest door prizes, a club table, media coverage, Elmer tours, a test table, sellers, buyers, and much more.

Saturday March 18, 2023 7AM till Noon Loomis Train Station, Talk in Frequency 146.535

For more information: <https://www.w6ek.org/activities/hamfest>

QRP Operation: How Low Can You Go?

By Troy Blair, KE8DRR

This game could go on forever.

In my previous articles I talked about portable operations. We looked at things like Field Day, International Lighthouse and Lightship Weekend, Parks on the Air, and the like. We covered operating out of a self-sufficient gig-type case down to having everything in a backpack.

Today we are going to delve into QRP operations—making things as small and light as possible as well as using minimal power. By definition, QRP is five watts or less. Many expand that to encompass newer transceivers up to around 15 watts.

I began working QRP several years ago. I always enjoy a challenge. I started off with my expectations pretty low. I looked at this like another EMCOMM tool. I thought if I could have a completely self-contained station that I could carry in a pack about the size of my lunch bag and talk across the state and maybe the surrounding states, that would be perfect. I quickly had to readjust my sights. I learned that with the proper antenna and conditions, transatlantic QSOs were possible at only five watts.

So let's look at the equipment. Like I've mentioned in previous posts, my equipment choices were based on the knowledge and budget that I had at the time. For the transceiver, I chose the Yaesu FT-818ND. This transceiver covers not only all HF bands (160m-6m) but also 2m and 70cm, making it great for traveling. The rig also had its own battery, which eliminated the need for a "power pack." All this and a whopping six watts added up to what I hoped would be a whole lot of fun.

As far as the necessary peripherals, I used the LDG Z-817 automatic tuner, which is designed to work specifically with this radio. In terms of antennas, I have tried several commercial models, choosing the



MFJ-1899T portable telescopic HF antenna and the Par EndFedz EFT-102040 end-fed half-wave covering 40/20/10m. Although they each work in different situations, my preferred choice is a home-brew dipole using DX Engineering 26 AWG antenna wire cut for the band I am using and elevated using the DX Engineering collapsible 25-foot fiberglass mast.

I sometimes will use the internal battery which will last for short QSOs or while monitoring. For prolonged use I employ a small transportable 12Ah LiFePo battery that provides hours of operation. The entire setup fits nicely in a small tactical pouch and is easily transported.

A bit of advice to those who are thinking about trying QRP. Don't assume that just because your setup is light and portable that it can go up anywhere. While that is true in terms of footprint, think hard about where your antenna will get the best exposure and be free of interference. Speak clearly and boldly. Screaming into the mic will most likely distort your voice and it will fade into the noise. Finally, be patient. Reach out with persistence and you will hit the opportune time to be heard.

If you are looking for a challenging operating mode that provides a ton of fun and satisfaction, give QRP a try.

A New Design of a 40-6-Meter Off-Center-Fed Dipole

You might know that a 40-meter dipole is also usable on 15, since 21 MHz is an odd harmonic of 7 MHz. But as W1IS and KC1DSQ explain, you're still going to need a tuner for one band or the other ... unless ... unless you build their variation that makes the antenna resonant on five bands!

By BOB GLORIOSO, W1IS and BOB ROSE, KC1DSQ

A 40-meter off-center-fed dipole (OCFD) is a versatile antenna for portable operation or space-constrained fixed stations because it is a manageable length and can cover 40, 20, 15, 10, and 6 meters with low SWRs. To make an OCFD antenna work well on the higher bands, the resonant frequency must be placed at the bottom of the fundamental band, typically between 7.0 and 7.05 MHz. This article explains how to build a 40-meter OCFD with resonances within the bands and is especially useful on rigs without a built-in tuner (such as the Yaesu FT-818 or the ICOM IC-705) or with lengths of coax less than 100 feet. It will draw upon the techniques described in our 160 and 80-meter OCFD CQ article¹ to deliver less than 3:1 SWR across all five bands using only 50 feet of RG-8X.

Design

A 40-meter center-fed dipole resonates on odd multiples of the fundamental frequency. By moving the feedpoint away from the center, we get resonance on even harmonics as well. However, due to the lack of end-effect on the half wave/s in the middle of the antenna, the harmonics occur at slightly higher frequencies than integer multiples of the fundamental. For example, a center-fed dipole tuned to 7.15 MHz has a third harmonic resonance at 21.7 MHz instead of the expected 21.45 MHz. This is explained in some detail in our OCFD article in the June 2020 issue of CQ.¹

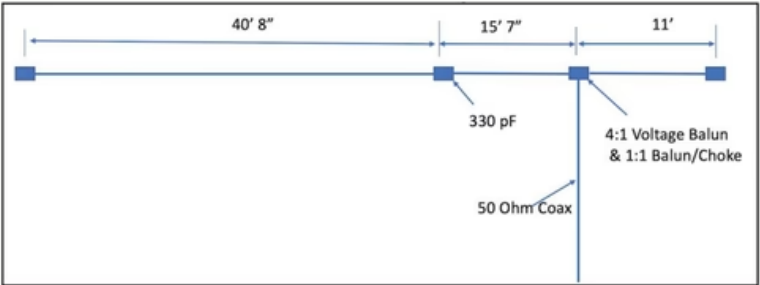


Figure 1. Center-loaded, off-center-fed dipole (CL-OCFD) with feed at 16.4%, total length = 67.35 inches.

Band (meters)	Resonant Frequency (MHz)
40	7.05
20	14.46
15	21.56
10	28.70
6	50.55

Table 1. Resonant Frequencies for an OCFD tuned to 7.05 MHz.

The resonant frequencies of the fundamental and harmonics are determined by the length of the antenna and the number of half waves without end effect. Moving the feedpoint changes the SWR at those resonances, but does not change their resonant frequencies. The resonances for any 40-meter OFCD tuned to 7.05 MHz are shown in Table 1.

This shows the dilemma facing an OCFD designer. With the fundamental tuned to the bottom of 40 meters, the resonant frequencies for 20 and 15 meters are still above the top of the band. The designer's task then is to move the feedpoint and / or alter the length to change the SWR and the resonant frequencies. Fortunately, this "Whack-A-Mole" exercise has a reasonable solution.

Many OFCD designs place the feedpoint at 33% of the length, but this does not resonate on 15 meters. By moving the feedpoint to 20% or less, we get a nice 15- meter resonance at the expense of slightly higher SWRs on some of the other bands. This is a small price to pay to get 15-meter coverage.

The Center-Loaded Off-Center-Fed Dipole (CL-OCFD)

The typical OCFD can be improved using a technique called "center loading" invented by Serge Stroobandt, ON4AA. His website has extensive information about building an 80-meter CL-OCFD.² The basic principle is to place a capacitive load at the center of the antenna where the peak current occurs for the fundamental frequency. This raises the resonant frequency for the fundamental and odd harmonics. For even harmonics, the current is at a null at the center, so the capacitor has no effect on their resonant frequencies. In the 40-meter case, the capacitor affects 40 and 15 meters and has no effect on 20 or 10 meters. The effect on 15 and 6 is smaller because the capacitive reactance is lower at the higher frequency. With this tool, we can lengthen the antenna to bring the high- band resonances within the band, then bring 40 up to mid-band with the capacitor.

The 40-meter CL-OCFD design is shown in Figure 1. The dimensions shown are for #14 insulated wire such as THHN or Davis FlexWeave™.

Optimizing this antenna resulted in some departures from the assumed positions for the feedpoint and load. The 20-meter SWR was reduced by moving the feedpoint from 20% of the antenna's length to 16.4%. The 10-meter resonance was moved a little higher by moving the load from 50% (the center) to 61%. These compromises placed the load on the current peak for 10 meters closest to the center.

In our testing of both the capacitively loaded OCFD and a more conventional 40- meter OCFD with a 20% offset feed, SWR on the lower bands is comparable but the capacitively-loaded OCFD is significantly better on 10 and 6 meters.

For more information see: <https://batteryeliminatorstore.com/blogs/ocf-masters-articles/a-new-design-of-a-40-6-meter-off-center-fed-dipole>

Despite the snow and power outages, our GEARS repeaters have been working and remain in service.

GEARS Repeaters

GEARS West on St. John
145.410 MHz PL is 123.0 Negative offset.
PL both input and output (CTSS)

GEARS East in Forrest Ranch
146.850 MHz Negative offset. PL 110.9 CTSS
440.650 MHz Plus offset, PL 110.9 Hz

GEARS CENTURY MEMBERS

Michael Ellithorp Kent Hastings
Bennett Laskey Jim Van Sickle

We thank these members for their extra support.

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<https://drive.google.com/GEARS>

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